IN THE CLAIMS:

1. (Currently amended) A diffusion resistor comprising:

a substrate;

a diffusion region formed in the substrate;

a first contact region extending down from a surface of the substrate;

a second contact region extending down from the surface of the substrate;

a first conductive contact electrically connected to the first contact region such that current can flow between the first contact and the first contact region;

a second conductive contact electrically connected to the second contact region such that current can flow between the second contact and the second contact region; and

a third contact connected to the surface of the substrate, wherein the third contact is located between the first conductive contact and the second conductive contact, wherein the third contact forms a Schottky diode such that application of a voltage to the third contact forms a depletion region that changes in size depending on the voltage applied to the third contact to change a resistance in the ~~depletion~~ diffusion resistor, wherein the first conductive contact and the second conductive contact form two ends of the diffusion resistor.

2. (Original) The diffusion resistor of claim 1, wherein the third contact is connected to the surface by a salicided region.

3. (Original) The diffusion resistor of claim 1, wherein the substrate is a p-type substrate.

4. (Original) The diffusion resistor of claim 1, wherein the substrate is an insulator in a silicon-on-insulator substrate.

5. (Original) The diffusion resistor of claim 3, wherein the first contact region and the second contact region are n+ contact regions.

6. (Currently amended) The diffusion resistor of claim 5, wherein the first conductive contact, the second conductive contact, and the third contact are formed using metal layers.

7. (Original) The diffusion resistor of claim 6, wherein the metals layers are tungsten metal layers.

8. (Original) The diffusion resistor of claim 1, wherein the diffusion region contains n-type dopants having a concentration of about $1 \times 10^{15}/cm^3$.

9. (Original) The diffusion resistor of claim 1, wherein the first contact region and the second contact region contain n-type dopants having a concentration of about $1 \times 10^{18}/cm^3$ to about $1 \times 10^{20}/cm^3$.

10-19. (Withdrawn)

20. (New) The diffusion resistor of Claim 1, in combination with a driver circuit having an input and an output, wherein the diffusion resistor is coupled between the input and the output of the driver circuit to provide a variable resistance feedback path.